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1935

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF HOME ECONOMICS
Washington, D. C.

ACID-FORMING FOODS AND ALKALINE OR BASE-FORMING FOODS

The attached lists of acid-forming and base-forming foods have been prepared for individuals who wish to select diets with reference to their potential acidity or alkalinity. The tissues and fluids of the body are normally alkaline but an over-abundance of acid-forming elements in the diet may lead to a condition of acidosis. The general tendency in this country seems to be toward diets containing too large a proportion of foods which are acid-formers. For these reasons it is important to emphasize the potentially basic foods, and limit the consumption of foods that are acid-forming.

Nearly all of the vegetables and fruits that have been studied are alkaline or base-forming. Cranberries, prunes, and some types of plums are among the exceptions. These fruits produce an alkaline ash, but they contain substances that form hippuric acid in the body and act as acid-forming foods. Brussels sprouts, among the leafy vegetables, are an exception in that they are calculated as acid forming. Most legumes that have been studied produce an alkaline ash, but peanuts and lentils have an acid ash. Meats, fish, poultry, and eggs, and also cereals and their products are among the acid-forming foods. Fats and sugars are considered as neutral.

Several foods, such as oranges, grapefruit, and tomatoes, that are acid in taste because they contain organic acids, are counted as alkaline because of their effect upon the reaction of the blood and tissues after the acids are used up in the body. Although they are acid when they go into the stomach they have the effect of reducing the acidity of the body fluids, because the base-forming elements are present in excess of the acid-forming elements.

There are, however, conditions in which a bland diet, low in organic acids, is recommended, especially when it is necessary to avoid irritation in the stomach. In such cases the attached lists are not applicable since they are based on the potential effect of the food in the body rather than on its actual acid content before it is eaten. Information on organic acid content of fruits is included in Circular 50, "Proximate composition of fresh fruits", which is published by this bureau.

411-R (1-22-35)

Food Composition Section,

JUL 16 1945

ALKALINE OR BASE-FORMING FOODS

Almonds	Lemons
Apples	Lettuce
*Apricots	Milk
Asparagus	Muskmelon
Bananas	Olives
Beans, common, seeds	Oranges
Beans, snap or string	Parsnips
Beans, lima	Peaches
Beets	Pears
*Buttermilk	Peas
Cabbage	*Pineapple
Carrots	Potatoes
Celery	Radishes
Chard	Raisins
Chestnuts	Rutabagas
*Cowpeas	*Soybeans
Cucumbers	*Spinach
Dates	*Strawberries
*Figs	Sweetpotatoes
*Grapefruit	Tomatoes
*Grapes	Turnips
*Hazelnuts	*Turnip tops
*Kale	Watermelon

ACID-FORMING FOODS

Bread, white	Egg white	Meat, veal
Bread, whole wheat	Egg yolk	Oatmeal
*Brussels sprouts	Fish	Oysters
*Cheese, cheddar	*Lentils	Peanuts
Corn, sweet	Meat, beef, lean	**Prunes, plums
*Corn meal	Meat, chicken	Rice
Crackers	Meat, frog	*Walnuts
**Cranberries	*Meat, lamb or mutton	Wheat, entire
Eggs	Meat, pork, lean	Wheat flour, white
	Meat, rabbit	

These lists are based on information taken mainly from the following sources, which give quantitative values:

(1) Sansum, W. D.

The normal diet. Ed. 3, rev. 134 pp. The
C. V. Mosby Company, St. Louis. 1930.

(2) Sherman, H. C.

Chemistry of food and nutrition. Ed. 4, 636 pp.
The Macmillan Company, New York. 1932.

(3) Sherman H. C., and Gettler, A. O.

The balance of acid-forming and base-forming elements
in foods, and its relation to ammonia metabolism.
Jour. Biol. Chem. 11: 323-328. 1912.

* These foods are not listed in any of the sources given, but they belong in this group of foods according to calculations made from data on minerals, taken chiefly from the mineral tables in "Chemistry of food and nutrition," by H. C. Sherman.

** Although these foods yield an alkaline ash they are classified as acid-forming foods because cranberries, prunes, and some types of plums form hippuric acid in the body and increase the acidity of the urine.

